

Ç ĩñãŨíùóç ôùí Âêäüóãùí ôĩõ FreeBSD

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\$FreeBSD: release/8.4.0/el_GR.ISO8859-7/articles/releng/article.xml 39632

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2012-10-01 11:56:00Z gabor \$

Άδου οĩ Ũñēñĩ ðãñēãñŨóãē ôçĩ áíôēíãððēóç ēáē ĩñãŨíùóç ôçð ñŨããð áíŨððôĩçð ôĩõ FreeBSD, ùóĩí áöĩñŨ óôçĩ ðñĩãôĩēíãóßã ðĩēĩôēēĩ ãēãüóãùĩ ôĩõ Êãēôĩõñãēēĩý Óôóðßíãôĩõ FreeBSD. Âĩçããß ĩã ēãððñŨñãēã ôçĩ ĩãēĩãĩēĩãß ðĩõ ÷ñçóēĩĩðĩēãßðãē áēã ðēð ãðßçĩãð ãēãüóãēð ôĩõ FreeBSD ēáē ðãñēãñŨóãē óã ãñããēãßã ðĩõ ãßĩãē áēãēýóēĩã óã ùóĩõð ãĩãēãóŨñĩóãē ĩã ðãñŨãĩõĩ ðãñãĩãðñĩðĩēçĩýĩãð ãēãüóãēð ôĩõ FreeBSD áēã ãóùðãñēēß ð ãĩðĩñēēß ÷ñßóç ēáē áíŨððôĩç ðñĩũĩĩôũĩ.

Ðßĩãēãò Ðãñēã÷ñŨýĩùĩ

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1 Âéóããũãß

Ç áíŨððôĩç ôĩõ FreeBSD ãßĩãē ĩēã ðĩēý áĩē÷ðß ãēããēããóßã. Ôĩ FreeBSD áðĩðãēãßðãē áðũ óôĩãēóöĩñýð ÷ēēēŨãũĩ áĩēñßðũĩ áðũ ùēĩ ôĩĩ ēũóĩĩ. Ç ñŨãã ðĩõ FreeBSD ðãñý÷ãē ðñũóããóç ĩýóũ áĩßĩôĩĩõ CVS[1] óã ùēĩõð, ýóóē ðóðã ĩã ðĩñãß ùðĩēĩð ēýēãē ĩã ããē ĩçýĩãóã log, ãēãöĩñýð (patches) ðĩõ ý÷ĩõĩ óã ãēŨöĩñã development branches, ēáē Ũēēã ÷ãñãēðçñēóóēēŨ ðĩõ ãĩçēĩýĩ ôçĩ áíŨððôĩç, óã ĩðĩßã ðñĩēýððĩõĩ áðũ ôçĩ ÷ñßóç áĩũð áððôçñĩý óôóðßĩãôĩõ ãēã÷ãñēóçð ēßãēã. Áðũ ãðĩðýēãóã ēáē ôĩĩ ðēĩ ôçĩáĩóēēũ ðãñŨãĩõã ýēĩçð ãēã ýĩã ĩããŨēĩ ãñēēĩũ áðũ óãēãĩôĩý÷ĩõð ðñĩãñãĩĩãóóóýð áðũ ùēĩ ôĩĩ ēũóĩĩ óôĩ FreeBSD. Âßĩãē ðñĩóãĩýð, ãýããēã, ðũð ðĩēý óýĩôñã ēã ãß÷ã ãßĩãē áĩóãēðð ÷ãĩôēēß ç ēãðŨóóãóç áĩ ãß÷ãĩ ùēĩē, áðũ ùēĩ ôĩĩ ēũóĩĩ, ðñũóããóç ĩã ãñŨðĩõĩ óôĩĩ ēßãēã. Âē' áðũ, ĩũĩ

ιέα “ἈδέεἰἄἱΎίç” ñŬἂἂ ἂδù ḁἂñḂḁìò 300 Ŭòñἂ ὕ÷ìò ḁñùóἂἂόç ιἂ ἂñŬḁìòì óòì CVS repository. ἈḁòìḂ ìé *committers*[6] ἂḂιἂé ḁḁἂḃḁḁḁḁḁ ἂéἂ òì ìἂἂἂḃḁḁñì ìŬñìò ḁçḁ ἂíŬḁḁḁḁḁḁ ḁìò ἂḂιἂḁἂé óòì FreeBSD. ìéἂ *ḁἂìòñḁḁḁḁ-ñŬἂἂ*[7] (core team) ἂδù ἂéἂḁḁñḁḁḁḁ ὕḁḁ ḁḁḁḁḁḁ ἂéἂ ιἂ ḁἂñŬ÷ἂé ḁḁḁ ḁŬḁḁḁḁ ἂḂἂḁḁḁ ḁἂḁḁḁḁḁç ḁἂé ιἂἂ ḁἂḁḃḁḁḁḁç óòì óḃḁḁḁ òùì committers.

Ìé ḁἂ÷ḃḁḁḁḁ ñḁḁḁḁ ἂíŬḁḁḁḁḁ ḁìò FreeBSD ἂἂἂ ἂḁḁḁḁḁ ḁἂḁ ḁḁḁ ÷ñùḁ ἂéἂ òì ìἂḁἂḁŬñḁḁἂ ḁìò ḁḁḁḁḁḁḁḁ ἂíŬḁḁḁḁḁ ḁἂ ιἂἂ ὕḁḁḁḁç ιἂ ḁḁḁḁḁḁḁ ḁìò ιἂ ἂḁḁἂḁ ιἂ ÷ñçḁḁḁḁḁḁḁ ἂḁñŬḁḁ. Ἀḁἂ ιἂ ḁḁḁḁḁ ἂḁḁ òì ἂḂḁḁḁḁḁ, ç ἂíŬḁḁḁḁ ἂḂιἂḁἂé ḁἂḁḁ ÷ñḁἂ ḁἂ ἂḁḁ ḁἂñŬḁḁḁḁ ḁḁñḁŬḁἂ. Ì ḁḃḁḁḁ ḁḁñḁḁ ἂíŬḁḁḁḁḁ ἂḂιἂḁ ì *HEAD* ḁ *trunk* óòì CVS repository ιἂḁ, ἂñḁḁḁḁ ḁἂḁ ḁḁ “FreeBSD-CURRENT”, ḁ “-CURRENT” ἂḁ ḁḁḁḁḁḁ.

ἁἂḁ ḁḁḁḁḁḁḁ ḁḁñḁḁ ḁḁḁḁḁḁḁḁ, ἂñḁḁḁḁ ḁἂ ḁḁ ḁḁñἂ “FreeBSD-STABLE” ḁ ḁḁḁ ḁḃḁḁḁ “-STABLE”. ḁἂḁ ìé ἂḁḁ ḁḁñḁḁ ἂḂιἂḁ ἂḁḁḁḁḁḁḁ ḁḁḁ ḁḃḁḁḁ CVS repository, ḁḁç Ìἂḁḁḁñḁἂἂἂ, ḁἂḁ ἂíḁḁḁñŬḁḁḁḁḁ ὕḁḁ *CVSup*[2] ḁἂ mirrors ḁἂḁḁḁ ḁḁḁ ḁḁḁḁ. Òì FreeBSD-CURRENT[8] ἂḂιἂḁ ç “ḁñḁḁç ḁἂḁñŬ” ḁçḁ ἂíŬḁḁḁḁḁ ḁìò FreeBSD ḁἂḁḁ ḁἂ ἂḁḁḁ ἂḂḁḁḁḁ ḁñḁἂ ḁḁḁ ìé ḁἂḁḁḁḁḁ ἂḁḁἂŬḁ. Òì FreeBSD-STABLE ἂḂιἂḁ ì ḁḁñḁḁ ἂíŬḁḁḁḁḁ ἂδù ḁḁḁ ḁḁḁḁ ḁḁḁŬ÷ñḁḁḁ ሁḁ ἂḁḁḁḁḁ. Ìḁ ἂḁḁἂŬḁ ἂḁḁŬñ÷ñḁḁ ḁἂ ἂḁḁḁḁ, ḁḁḁ ἂḃḁḁḁḁ ḁḁñḁ ἂíŬḁḁḁḁḁ, ιἂ ḁḁḁ ἂñḁḁ ḁḁḁḁ, ἂḁḁḁ ḁñḁḁἂ (ḁḃḁḁḁḁ ιἂ ḁçḁ ḁḁḁḁḁḁḁ ἂḁḁ) ἂḁḁἂἂḁḁḁḁ ḁḁḁ FreeBSD-CURRENT ḁἂḁ ὕ÷ìò ἂἂḁḁḁḁḁḁ ḁḁḁ ḁἂḁŬ.

ḁἂḁŬ ḁçḁ ḁἂñḁḁḁ ḁìò ìἂḁḁἂἂḁ ἂδù ḁç ιἂἂ ὕḁḁḁḁ ḁḁçḁ ἂḁñḁἂḁḁ, ḁḁḁŬ÷ñḁḁḁ ḁἂḁḁḁḁḁḁ snapshots ἂδù ḁἂ ḁç÷ἂḁἂḁἂ ḁçḁ ñŬἂἂḁ ḁìò FreeBSD ḁἂḁ ἂḂιἂḁ ἂḁἂḁḁḁḁḁ ἂδù ḁḁḁ ἂḁḁḁḁḁḁḁḁ <ftp://stable.FreeBSD.org/>. Ç ìἂἂŬḁḁ ἂḁἂḁḁḁḁḁḁ ḁḁḁ ἂḁḁḁḁḁḁḁ snapshots, ḁἂḁḁ ḁἂḁ ç ḁŬḁç ḁçḁ ḁḁḁḁḁḁḁḁ ḁḁḁ ÷ñçḁḁḁ ἂḁḁ ιἂ ἂḁḁḁḁḁḁḁ ḁἂ ḁç÷ἂḁἂḁἂ ḁḁḁ ḁḁḁ ḁḁḁ ḁḁḁ ḁḁḁḁḁḁḁ -STABLE ἂḁḁḁḁḁḁ ὕḁḁ *CVSup* ḁἂḁ “make world”[8] ἂḁḁḁḁḁ ιἂ ḁἂḁḁḁḁḁ ḁḁḁ FreeBSD-STABLE ḁἂ ιἂἂ ḁḁḁ ἂḁḁḁḁḁḁ ḁἂḁŬḁḁḁḁ ἂḁñἂ ḁἂḁ ḁḁḁ ì ḁḁḁḁḁ ḁḁḁ ἂḁŬḁ÷ñḁ ḁḁḁḁḁḁ ἂḁḁḁḁḁ ḁḁḁ ḁḁḁ ḁḁḁ ḁḁḁ ḁḁḁ ḁḁḁḁḁḁ ἂḁḁ ὕḁḁḁḁḁḁ ἂḁḁ ὕḁḁḁḁḁḁ ḁἂḁ ὕḁḁḁḁḁḁ ḁḁḁḁḁḁḁḁ.

Óḁḁἂ÷ḁḁ ḁḁŬḁḁḁḁ ἂδù ḁḁḁ ÷ñḁḁḁḁ ἂḁ ἂḁḁḁḁḁ ḁἂἂ ḁἂḁḁḁḁḁ ἂἂἂ ḁἂḁḁḁḁḁḁḁ ÷ἂἂḁḁḁḁḁḁḁḁ, ḁἂḁŬ ḁç ἂḁŬñḁἂἂ ḁḁḁ ḁḃḁḁḁ ḁçḁ ḁŬḁἂ ὕḁḁḁḁ. Ìḁ ἂḁḁḁḁḁ ḁñḁḁḁḁḁḁ ἂḁḁŬḁḁḁḁḁ ḁḁçḁ ἂŬḁç *GNATS*[9] ὕḁḁ e-mail, ιἂ ḁçḁ ἂḁḁñḁḁḁ send-pr(1), ḁ ὕḁḁḁ ḁḁḁ web-interface ḁìò ḁἂñŬ÷ἂḁḁ ḁḁçḁ ἂḁḁḁḁḁḁ <http://www.FreeBSD.org/send-pr.html>. Ἀḁḁḁ ἂδù ḁḁḁ ἂḁŬḁḁḁḁ ḁḁḁḁḁ çḁḁḁñḁḁḁḁḁ ḁἂ÷ḁḁñḁḁḁḁ ἂἂ ḁŬἂ ḁἂ ḁἂ÷ìḁŬ ÷ἂἂḁḁḁḁḁḁḁ ḁḁḁ FreeBSD ḁḁŬñ÷ἂḁ ḁἂḁ ç ḁḁḁḁ FreeBSD Quality Assurance mailing list (<http://lists.FreeBSD.org/mailman/listinfo/freebsd-qa>), ç ḁḁḁἂ ḁἂñŬ÷ἂḁ ὕḁḁ ὕḁḁ ḁḁñḁḁ ἂἂἂ ḁḁḁḁḁḁḁḁ ḁ÷ἂḁḁḁḁ ἂἂ ḁḁḁḁḁḁḁḁ ḁçḁ “ñḁḁŬḁḁḁ ḁḁḁ ἂḁḁḁḁḁḁḁḁ”.

Ἀḁἂ ιἂ ἂḁḁḁḁḁḁḁḁḁ ሁḁ ḁḁḁ ḁḁḁḁḁḁḁḁ ÷ñḁḁḁḁ ἂḁḁ, ιἂ ὕḁḁḁḁ ḁḁḁ FreeBSD 4.3 ἂñ÷ḁḁἂ ἂἂ ÷ñçḁḁḁḁḁḁḁḁ ἂἂ÷ḁñḁḁḁḁḁ ḁḁñḁḁḁ ἂḁḁḁḁḁ. Ἀḁḁḁḁ ሁḁ ḁḁñḁḁ ἂḁḁḁḁḁḁḁḁ ḁḁḁ ḁñḁḁ ḁḁἂ÷ḁḁ ç ḁἂḁḁḁ ὕḁḁḁḁ. ÌἂḁŬ ḁçḁ ἂḁḁḁḁḁḁ ḁçḁ ὕḁḁḁḁḁ, ìñḁ ḁḁḁ ḁçḁḁḁḁḁḁ ἂḁḁἂŬḁ ḁἂḁ ḁñḁḁḁḁḁ ḁ÷ἂḁḁḁḁ ἂἂ ḁçḁ ἂḁḁŬḁἂἂ ἂḁñḁḁḁ ḁḁḁ ḁḁñḁ ḁçḁ ὕḁḁḁḁḁ. Ἀḁḁḁ ἂδù ḁçḁ ἂḁḁḁḁḁḁḁ ἂḁἂḁŬḁḁḁḁ ὕḁḁ *CVS*, ἂḁḁḁḁḁḁḁ patchkits ḁḁḁŬ÷ñḁḁḁ ἂἂἂ ιἂ ḁḁñḁḁḁḁ ἂἂḁḁḁḁḁḁḁ ḁḁḁ ḁḁḁḁḁḁḁḁ ḁḁḁ ḁḁḁ ÷ñçḁḁḁḁḁḁḁ ḁḁḁ ἂḁḁḁḁḁḁḁ *RELENG_X_Y*.

Òì Òìḁἂ 2 ἂḁḁḁḁ ἂἂ ḁḁḁḁñŬñḁḁḁ ḁἂ ἂḁŬḁḁḁ ḁḁŬἂἂ ḁçḁ ἂἂἂḁḁḁḁḁ ḁḁḁ ἂñḁḁḁḁḁḁ ḁḁḁ ἂδù ḁŬἂ ὕḁḁḁḁ, ὕḁ÷ñḁ ḁἂḁ ḁἂ ḁḁἂḁἂ ḁìò ḁḁḁḁḁḁ ḁçḁ ἂḁḁḁḁḁḁḁḁ ḁḁḁ ḁḁḁḁḁḁḁḁ ḁἂḁ ḁḁḁḁḁḁḁḁ ḁçḁ ἂḁἂḁḁ ḁçḁ ἂἂἂḁḁḁḁḁ ḁçḁ ἂḁḁḁḁḁḁḁḁ. Òì Òìḁἂ 5 ḁἂñḁḁñŬḁḁḁ ḁḁḁ ḁḁñḁḁ ἂἂ ἂḁḁḁḁḁḁḁ ḁḁ ἂḁḁḁḁ ḁḁḁḁḁ ἂδù ḁñḁḁḁḁ ḁἂḁ ḁḁḁḁḁ 6 ḁἂñḁḁñŬḁḁḁ ḁŬḁḁἂ ἂδù ḁἂ ḁñŬἂἂḁἂ ḁḁḁ ḁḁḁḁḁḁḁ ὕḁḁḁḁḁ ὕḁḁḁḁḁ ἂḁḁḁḁḁḁḁ ḁḁḁḁḁḁḁḁ 4.4. ÓŬḁḁ, ḁḁ Òìḁἂ 7 ḁἂñḁḁḁḁḁḁḁ ḁŬḁḁḁ ḁḁḁ ḁἂḁḁḁḁḁḁḁ ḁḁḁ ḁŬñḁḁ ἂἂ ἂíŬḁḁḁḁ ḁḁḁ ὕḁḁḁḁ.

2 Ç Ἀḁἂḁḁḁḁḁḁ Ἀçìḁḁḁñḁḁḁ ἂḁḁ ḁἂḁḁḁ

Ìḁ ሁḁḁ ἂḁḁḁḁḁḁ ḁḁḁ FreeBSD ḁḁḁŬ÷ñḁḁḁ ἂδù ḁḁḁ -STABLE ḁḁñḁ ἂíŬḁḁḁḁḁ ḁἂñḁḁḁ ḁŬἂ ḁŬḁḁḁḁḁ ሁḁἂḁ. Ç ἂἂἂḁḁḁḁḁḁ ḁñḁḁḁḁḁḁḁ ἂḁḁ ὕḁḁḁḁḁ ḁ÷ἂḁḁ 45 ὕḁñḁḁ ḁñḁ ḁçḁ ἂḁḁḁḁḁḁḁ ḁἂñḁḁḁḁ ὕḁḁḁḁḁ, ḁḁἂ ሁ ḁḁḁḁḁḁḁ ἂḁḁḁḁḁ ḁḁḁ FreeBSD ḁḁŬḁḁḁ ὕḁḁ ἂñŬἂ ḁḁḁ ḁḁḁḁ ḁḁḁ ḁñḁḁḁḁḁḁḁḁ ἂἂἂ ιἂ ḁḁḁḁḁḁḁḁ ḁḁḁḁ ḁñḁḁḁḁḁḁḁḁḁ ḁḁḁ ὕ÷ìò 15 ὕḁñḁḁ ḁἂḁḁ ἂἂ ḁŬñḁḁ ḁḁḁḁ ἂḁḁḁḁḁ ḁŬḁḁḁ ḁḁḁ ḁḁḁḁḁ. ÌŬἂ ḁἂ

áðòù òîí ēáēññ, ðîēēīĬ ðñîññāñîáðēóóŸ òēŪîîîí íēá óáēñŪ áðñ áēēááŸ ðîō Ÿ ÷ îîí îāĬíāē ðēŸîí āîñóóŸ ùò “îāēāēāñĬóíáóá MFC”. Ĭ ùñîð MFC óçíāĬíāē “Merge From CURRENT” ēáē ðññēāñŪôāē óçí āēáāēēáóĬā ðñîóāñîñāĬ òîō ēĬāēēá íēáð āîēēíáóíŸíç ðēēáāĬ ðñ òîí -CURRENT ðñēñāíáðēēñ ēñññū áíŪððòîç òóîí óðāēāññ -STABLE ēñññū.

2.1 ĩāā ÷ îō ĒĬāēēá

ÔñēŪíóá çîŸñāð ðñēí óçí áíāíāîññíāíç çîñññçíĬā Ÿēāîóçð, Ĭ ēĬāēēáð òîō repository áēóŸñ ÷ āðāē óā íēá ðññĬñññ “ēāēóóóŸñçóçð”. ĒáðŪ óç āēŪñēāēá áððĬð òçð ðññēññññ, ùēāð íē āēēááŸ òóîñ -STABLE ēñññū ðñŸðāē íá Ÿ ÷ îîí óçí Ÿāēñēóç òçð ñŪāā ĬñāŪîúôç òùí Āēüüóâùí <re@FreeBSD.org>. Ĭē āēēááŸ ðîō āðēóñŸðñîóāē óā áððĬ òçí ðññĬñññ ðîō āēāñēāĬ 15 çîŸññā ðñíāē:

- ĀēññēĬóāēð āîñóóĬí ðññāēçîŪðñí.
- ĀíçîññĬóāēð òóçí ðāēîçñĬññóç.
- ĀēēááŸ ò ÷ āðēēŸ ìā òçí áóðŪēāēá.
- ĬēēñŸ ðēēēáŸ òóîðð ñāçāîŸ ðððēāðĬí, ùðñð ð.÷. ç ðññîēĬēç òùí IDs íŸñí óððēāðĬí.
- ĬðñēāĬðñîā Ūēēç āēēáāĬ ðēóðāŸāē ç ñŪāā áíŪððòîçð ùðē ðñŸðāē íā āĬíāē, ìā òî áíāíāîñññ ðŪíóā ñĬóēî.

ĬāðŪ ðēð ðñĬóāð 15 ĬŸññāð ēāēóóóŸñçóçð, òðēŪ ÷ íāðāē íēá āîēēíáóðēēĬ Ÿēāîóç āēá íā ÷ ñçóēññññēçēāĬ óāí āîēēīĬ òçð ðāēēēĬð Ÿēāîóçð ēāē Ĭ ēĬāēēáð áēóŸñ ÷ āðāē óā íēá ðññĬñññ “ðāāĬíáðîð”. ðēŸîí āĬíāē ðñēŸ ðēí āŸóēîēî íā āĬñññ íŸāð āēēááŸ òóîí óŸóóçíā, āēðñð ēē áí āēññēĬññññ ēŪðñēí ðñēŸ òñāñññ ðñĬ ēŪðñēí ðññāēçíā áóðŪēāēáð. ĒáðŪ óç āēŪñēāēá òîō ðññĬíáðîð òîō ēĬāēēá, òîōēŪ ÷ ēóóîí Ĭā āîēēíáóðēēĬ Ÿēāîóç òðēŪ ÷ íāðāē ēŪēā āāññŪāā, ĬŸ ÷ ñē íā āĬíāē Ÿóîēîç ç ðāēēēĬ Ÿēāîóç. Ôēð çîŸññāð āēñēāĬð ðñēí óçí ðāēēēĬ Ÿēāîóç, ç ñŪāā ðîō āĬíāē òðāŸēðîç āēá ðēð āēüüóāēð āĬíāē óā òóñā ÷ Ĭ āðēēîēññññ Ĭā òçí ñŪāā áóðŪēāēáð, òçí ñŪāā òóîðĬñçóçð òçð ðāēîçñĬññóçð, ēāē òçí ñŪāā òóîðĬñçóçð òùí ports, āēá íā āāāēñññññ ðñð ùēā óā áðñāñāĬóçðā ēññŪðēá āēá íēá ðēĬñç Ÿēāîóç āĬíāē āēāēŸóēíā.

2.2 ĒĬóóā ĀēŸā ÷ îō òçð ÔāēēēĬð ĩāîîóçð

¼ðāí āñēāðŸ ðñēēíáóðēēŸ ðēüüóāēð Ÿ ÷ îîí āĬíāē āēāēŸóēíāð, Ÿ ÷ îîí āîēēíáóðāĬ áðñ āñēāðñ ēññññ ēāē ùēá óā òñāñŪ ēŸíāðā Ÿ ÷ îîí áíāēðēāĬ, ç ðāēēēĬ Ÿēāîóç ìðññāĬ íā āñ ÷ Ĭóāē.

2.2.1 ĀçîēîññāĬ òîō ĒñññŸ ĩāîîóçð

¼ðñð ðññēāñŪðñññ òóçí āēóāāññāĬ, Ĭē ēññññ ÒĒĒĒĒ_X_Y āĬíāē íēá ó ÷ āðēēŪ íŸā ðññîēĬēç òóçí ĬāēñññññāĬ òùí āēüüóāĬí Ĭāð. Ôî ðñĬðîí āĬíā òóçí āçîēîññāĬ áððîŸ òîō ēñññŸ āĬíāē íā āāāēññññññ ùðē āîōēāŸāðā Ĭā òçí ðāēāððāĬā Ÿēāîóç òîō ðçāññññ ēĬāēēá áðñ òîí ÒĒĒĒĒ_X ēññññ áðñ òîí ìðñññ ēā òðēŪñāðā òîí íŸñ ēññññ.

```
/usr/src# cvs update -rRELENG_4 -P -d
```

Ôî áðñññññ āĬíā āĬíāē íā āçîēîññāĬóāðā íēá āðēēŸðā (tag) òóî óçíāĬñ āēēĬíçóçð òîō ēñññŸ, Ĭóðā íā ìðññāðā íā āāĬā ðēð āēáðñŸŸ ìā òçí āñ ÷ Ĭ òîō ēñññŸ āŸēîēā òóîí ĬŸēēñ Ĭā òîí CVS:

```
/usr/src# cvs rtag -rRELENG_4 RELENG_4_8_BP src
```

Ēāē òñðā ìðññāðā íā āçîēîññāĬóāðā òîí íŸñ ēññññ Ĭā:

```
/usr/src# cvs rtag -b -rRELENG_4_8_BP RELENG_4_8 src
```

Όζιαΰοζ: Ίε άόέέΎόαο *RELENG_** άβίαέ άάόιαόιΎίαο άέα ÷ *ηΠόζ* άδύ οίόο *CVS-meisters* έάέ όζι *ηΰάά* ούι άέάυόάυι.

Ί ύνιό “*άόέέΎόα*” άβίαέ *ηηιεράβ* ούο *CVS*. Όζιαβίαέ Ύία ύμνά ούο έάεινβάέ ιέα όόάέάηειΎιζ Ύέαιόζ ούο έπαέέα όοι ÷ *ηύι*. × *ηζόειιθιέρ*ίόάο άόέέΎόαο όοι *δζάβ*ι έπαέέα *αιζεΰ*ια *υθιέρ*ι *οόέΰ*ιαέ όοι *ιΎέει* άέάυόάέο ούο *FreeBSD* ιά *ανβόέα* έάέ ιά ÷ *ηζόειιθιέρ*ά *άειν*άο ούι *βάει* έπαέέα ούο ÷ *ηζόειιθιέρ*εζέά άέα όέο *άδβόζ*ιαό *άέάυ*όάέο όζο *ηΰάά* ούο *FreeBSD*.

2.2.2 Άόιΰιιόάο ούι Άήέειυ έαίόζο

Θνεί ιθαέ ζ άόέέΎόά, *ιαόάέυ*όόέόόάβ έάέ *άοιέρ*αόόάβ ζ *οάέέ*Ύέαιόζ, *θνΎ*θαέ ιά *αβιι*ί *άέέα*Ύό *οόά* *θαάέ*ΰόυ *αν*÷*αβ*ά άέα ιά *θαή*Ύ ÷ *ι*οί ούι *ουό*όυ *άνέειυ* Ύέαιόζο άέα ού *FreeBSD*:

- `doc/en_US.ISO8859-1/books/handbook/mirrors/chapter.xml`
- `doc/en_US.ISO8859-1/books/porters-handbook/book.xml`
- `doc/share/xml/freebsd.ent`
- `src/Makefile.incl`
- `src/UPDATING`
- `src/gnu/usr.bin/groff/tmac/mdoc.local`
- `src/release/Makefile`
- `src/release/doc/en_US.ISO8859-1/share/xml/release.dsl`
- `src/release/doc/share/examples/Makefile.relnotesng`
- `src/release/doc/share/xml/release.ent`
- `src/share/examples/cvsup/standard-supfile`
- `src/sys/conf/newvers.sh`
- `src/sys/sys/param.h`
- `src/usr.sbin/pkg_install/add/main.c`
- `www/en/docs.xml`
- `www/en/cgi/ports.cgi`
- `ports/Tools/scripts/release/config`

Ίε όζιαέπόάέο Ύέαιόζο έάέ όά *αν*÷*αβ*ά ιά όέο *άειν*έπόάέο όζο *οάέ*άόόάβάο *οόέ*αίΠο *θνΎ*θαέ *άδβόζ*ο ιά *θνι*όάνιόόιγί *οόζ*ι *ιΎά* Ύέαιόζ (*οόι* *εινιυ* όζο Ύέαιόζο) έάέ ιά *αθα*ιανάόόιγί *εά*όΰέεζέά (*οόι*όό *αγ*ι *εινιυ*όό *stable* έάέ *current*):

- `src/release/doc/en_US.ISO8859-1/relnotes/common/new.xml`
- `src/release/doc/en_US.ISO8859-1/errata/article.xml`

Σ *αόάν*ιαΎ *sysinstall* *θνΎ*θαέ *άδβόζ*ο ιά *αιζ*ιανέαβ ιά ούι *ουό*όυ *άνέειυ* ούι *ports* έάέ ού ÷ *πν*ι ούο *αβόει*ο ούο *αθα*έόάβόάέ άέα όζι *Όόέει*αΎ ούι *Ports*. *Άό*όΎο *ιέ* *δεζ*νιόινβάο *οδ*ΰñ ÷ *ι*οί όοι *αν*÷*αβ*ι

`src/release/sysinstall/dist.c`.

Áōiŷ iēēēçñùēāß ç ðñīāōiēiāóāßá ôçð iŷáð āðßóçìçð Ýēāiōçð, ðñÝðāē íá áíçìāñþóāðā iāñēēŪ āñ÷āßá āēá íá áíçìāñþóāðā òiī ēüōiī āēá ôç iŷá Ýēāiōç òiō FreeBSD.

- `www/en/includes.xsl`
- `www/en/includes.xml`
- `www/es/includes.xml`
- `www/en/releases/*`
- `src/share/misc/bsd-family-tree`

2.2.3 Āçìēiōñāßá òuì Āōēēāði ôçð ēāiōçð

¼ðāí ç ðāēēēß Ýēāiōç āßiāē Ýōiēiç, ç ðāñāēŪðū āíōiēß ēā āçìēiōñāþóāē ôçí āōēēÝðā `RELENG_4_8_0_RELEASE`.

```
/usr/src# cvs rtag -rRELENG_4_8 RELENG_4_8_0_RELEASE src
```

İē ððāŷēðñē ôçð Ōāēiçñßuôçð ēāē òuì Ports āßiāē āðōiß ðiō ðñÝðāē íá āçìēiōñāþóiōi òēð āōēēÝðāð `RELEASE_4_8_0` óā ēāðŪēēçēā āŷiōñā ðçāāßiō ēþāēēā.

İāñēēÝð òiñÝð, iðñāß íá ÷ñāēáðāß íá āßiōi ēŪðñēāð āēēāāÝð ðāēāðōāßá óēēāiß *iāðŪ* ôçí òiðñēÝðçðç òuì āōēēāði. ĀāíēēŪ, āāi āßiāē āŷōēēi íá āßiāē ēŪðē ōÝōiēi āōiŷ òi CVS āðēðñÝðāē íá iāðāēēiþóāē ēŪðñēið òēð āōēēÝðāð iā āíōiēÝð ùððð `cvs tag -d tagname filename`. Āßiāē ðñēŷ óçìāíðēēü ùiðð āððÝð iē āēēāāÝð ôçð ðāēāðōāßāð ðōēēāiþð íá óçìāēüēiŷi iā òēð òuóðÝð āōēēÝðāð āēá ôçí óðāēāñēiŷiç Ýēāiōç. İē āðßóçìāð āēāuóāēð òiō FreeBSD ðñÝðāē íá āßiāē ðŪiðā āŷēiēi íá āíāðāñā÷ēiŷi. ŌiðēēÝð āēēāāÝð òōi ðāñēāŪēēēi òiō iç÷āíēiŷi òuì āēāuóāuī āāi āðēðñÝðñiðāē.

3 İāðāāēþðōēóç ôçð ēāiōçð

İē “āēāuóāēð” òiō FreeBSD iðñiŷi íá iāðāāēüðōēóðiŷi āðü iðñēiñāþðiðā Ý÷āē Ýiá ó÷āōēēŪ āñþāñi iç÷Ūiçìā ēāē ðñüóāáç óōi repository òiō ðçāāßiō ēþāēēā. (¼ēiē Ý÷iōi āððß ôç āōiāðüðçðā, āōiŷ ðāñÝ÷iōiā ðñüóāáç iŷōü āiþiðñiō CVS! Āāßðā òi Āā÷āēñßāēi òiō FreeBSD āēā ðāñēóóüðāñāð ēāððñÝñāēāð.) Ç iüiç āēāēēß āðāßðççç āßiāē íá ððŪñ÷āē ððñiððñēiç óōiī ððñÞiā óāð āēá ôçí óðōēāðß `vn(4)`. (Ōōi `-CURRENT`, āððß ç óðōēāðß Ý÷āē āíðēēāðāóāēāß āðü ôçí iŷá óðōēāðß āßóēið āāóēōiŷiñ òā iþiç `md(4)`.) Áí ç óðōēāðß āāi āßiāē āíōüiāðüŷiç óōiī ððñÞiā óāð, òüðā i ēāðŪēēçēið iāçāuð ēā òiñðüēāß āððüiāðā üðāí āēðāēāðāß ç āíðēß `vnconfig(8)` ēāðŪ ôç āēŪñēāēā ôçð òŪçðð āðñēiāóāð òiō iŷiōi āēēßiççð. ¼ēā ðā āñāāēāßā ðiō ÷ñāēŪāēiðāē āēá íá iāðāāēüððßóāðā iēā Ýēāiōç āßiāē āēāēÝðēiā óā iññðß ðçāāßiō ēþāēēā óōiī ēāðŪēēēi `src/release`. ĀððŪ ðā āñāāēāßā Ý÷iōi ùð óēiðü íá ðāñÝ÷iōi üðē ÷ñāēŪāēðāē āēá íá ðßāēiðāē iē āēāuóāēð òiō FreeBSD iā Ýiá óōiāðß ēāē óðāēāñēiŷiñ òñüðñi. İēā ðēþñçð Ýēāiōç iðñāß íá iāðāāēüðōēóðāß ÷ñçēiñðñēiþiðāð āððŪ ðā āñāāēāßā iā iēā ēāē iüñi āíðēßß, óðñāñēēāiāññÝiçð ēāē ôçð āçìēiōñāßāð āíüð ISO āñ÷āßiō ēāðŪēēçēi āēá íá ēāāß óā CDROM, iē āēóēÝððāð āēēßiççð, ēāēþð ēāē i ēāðŪēēçēið āāēāðŪóāóçð iŷōü FTP. Āððß ç āíðēßß āßiāē òðōēēß ç `make release`.

3.1 Ç āiðñēß `make release`

Āēā íá iāðāāēüððßóāðā āðēð÷þð iēā Ýēāiōç, ðñÝðāē ðñþðā íá ððŪñ÷iōi ðā ēāðŪēēçēā āñ÷āßā iŷiá óōiī ēāðŪēēēi `/usr/obj`. İðñāßðā íá ðā āçìēiōñāþóāðā āßðā iā ôçí āíðēßß `make world` ð āðēŪ `make buildworld`. Āēā íá

ðáóý÷-áé áðßóçð ç ìáðááëððóéóç òçð Ýêáîóçð ðñÝðáé íá äðáððá ðéð éáðÛëëçéáð ðéíÝð éáé ðá èÛðíéáð ìáðááëçðÝð:

- CHROOTDIR - Ì éáðÛëíáð ðîõ èá ÷ ñçóéíðíéçéáß ðáí ðáñéáÛëëí chroot áéá üëç òçí ìáðááëððóéóç òçð Ýêáîóçð.
- BUILDNAME - Õî üñíá òçð Ýêáîóçð ðîõ èá ìáðááëüððßðáðá.
- CVSROOT - Ì éáðÛëíáð ðóñí ìðíßí áñßóéáðáé òí CVS repository.
- RELEASETAG - Ç áðééÝðá CVS ðîõ áíóéóðíé÷-áß ðóçí Ýêáîóç òçí ìðíßá èÝéáðá íá ìáðááëüððßðáðá.

Áí ááí Ý÷-áðá ðáç ðñüóááóç ðá èÛðíéí ðíðéëü CVS repository ìá ðñí èðáééá ðîõ FreeBSD, ìðíáßðá ðÛíóá íá ððéÛíáðá òí áéëü óáð ðíðéëü CVS mirror ìá òí CVSup (http://www.FreeBSD.org/doc/en_US.ISO8859-1/books/handbook/synching.html#CVSUP). ÕðÛñ÷-áé Ýíá supfile, ðóí áñ÷-áßí /usr/share/examples/cvsup/cvs-supfile, òí ìðíßí ìðíáßðá íá ÷ ñçóéíðíéçéáðá áéá íá áíðéáñÛðáðá òí CVS repository ðîõ FreeBSD ðóí áéëü óáð ðíðéëü mirror.

Áí ðáñáëáßðáðá òçí áðééÝðá RELEASETAG, ðüðá èá ìáðááëüððéóðáß íéá ðëðñçð Ýêáîóç áðü òçí èíñðð ðîõ HEAD (áç. ðîõ -CURRENT) èíññí. Ìé áêüüóáéð ðîõ ððéÛ÷-ñíðáé áðü áððüí òñí èíññí, ðóíðëüð áíáðÝññíðáé ðáí “-CURRENT snapshots”.

ÕðÛñ÷-íðí éáé ðíééÝð Ûëëáð ìáðááëçðÝð ðîõ ìðíññí íá ÷ ñçóéíðíéçééí áéá íá ðáñáíáðñíðíéçéáðá òçí Ýêáîóç óáð. Ìé ðéí ðíééÝð áðü áððÝð ðéð ìáðááëçðÝð ðáñéáñÛñíðáé ðóçí èíñðð ðîõ áñ÷-áßíð src/release/Makefile. Ç áêñéáðð áíðíë ðîõ ÷ ñçóéíðíéçéáð áéá íá ððéá÷-ðáß ç áðßóçç Ýêáîóç 4.7 ðîõ FreeBSD (x86 ðéáðüüñíá) ðóáí:

```
make release CHROOTDIR=/local3/release \
    BUILDNAME=4.7-RELEASE \
    CVSROOT=/host/cvs/usr/home/ncvs \
    RELEASETAG=RELENG_4_7_0_RELEASE
```

Õí Makefile ðîõ ÷ ñçóéíðíéçéáðáé áéá íá ìáðááëüððáñíðáé ìé áêüüóáéð ìðíáß íá ÷ ùñéóðáß ðá áñéáðÛ ìá÷-ùñéóðÛ ìáðáíý ðîõð áðíáðá.

- Äçíëíðñáß áñüð éáéáññý ðáñéáÛëëíðíð ðá íéá ìá÷-ùñéóð éáñáñ÷-ßá éáðáëüüí ìá òçí áíðíë “make installworld”.
- Áíáñüá ðüð òí CVS ìéáð éáéññéáð Ýêáîóçð ðîõ ðçááßíð èðáééá ðîõ ððóððíáðíð, òçð ðáêñññüóçð éáé òñí ports ìÝóá ðóçí éáñáñ÷-ßá éáðáëüüí ìáðááëððóéóçð òçð Ýêáîóçð.
- Ñðéíßóáéð òñí áñ÷-áßí ðóñí éáðÛëíá /etc éáé /dev ìÝóá ðóí ðáñéáÛëëí chroot.
- ÁéðÝéáóç òçð áíðíëð chroot ìÝóá ðóçí éáñáñ÷-ßá éáðáëüüí ðîõ áðíéíÛóðçéá, áéá íá ìçí ìðíáß òí áñüðáñéëü ðáñéáÛëëí íá áðçñáÛóáé òç ìáðááëððóéóçð òçð Ýêáîóçð.
- ÁéðÝéáóç òçð áíðíëð make world ìÝóá ðóí ðáñéáÛëëí chroot.
- Ìáðááëððóéóç òñí áêðáëÝóéíð ðîõ áßíáé ó÷-áðééÛ ìá òí óýóççíá Kerberos.
- Ìáðááëððóéóç ðîõ ððñðíá GENERIC.
- Äçíëíðñáß áñüð ðáéééñý éáðáëüüíð ðóñí ìðíßí èá ìáðááëüððéóðíý éáé èá áðíèçéáððéñý ìé áêðáëÝóéíð ìñðÝð òñí ðáéééðí ðáéÝðüí.
- Ìáðááëððóéóç éáé ááéáðÛóðáóç òñí áñááéáßí ðîõ ÷ ñáéÛáñíðáé áéá òçí ðñíáðíéíáðá òçð Ýêáîóçð éáé òç ìáðáðñíð òçð ðáêñññüóçð áðü òñí ðçááßíð èðáééá (SGML) ðá html éáé áñ÷-áßá éáéíÝñð ðîõ èá ðóñíáññíðí òçí Ýêáîóçð.
- Ìáðáðñíð éáé ááéáðÛóðáóç òçð ðáêñññüóçð (áá÷-áéñßáéá ÷ ñðóðç, áéóáñüáééÛ éáßíáíá, óçíáéðáéð Ýêáîóçð, èßðáð ððíááðüðçðáðð ðéééñý, èèð.)

- ĩāóāāēpôóéóc òuĩ “òõĩðēáõĩŸĩũĩ” (crunched) āēðāēŸóēĩũĩ ðĩō ēá ÷ ñçóēĩĩðĩēçēĩŸĩ óóēð āēóēŸôðāð āāēáðŨóóáócð.
- Āçĩēĩōñābá òuĩ ðāēŸòuĩ ôçð āāēáðŨóóáócð ēáē òuĩ ðāēŸòuĩ ðçāābĩō ēpāēēá.
- Āçĩēĩōñābá òuĩ ĩŸóuĩ āēēbĩçóçð ēáē ôçð āēóēŸôðāð “fixit”.
- Āçĩēĩōñābá ôçð ēāñāñ÷báð ēáðāēüũĩ āēá ôçĩ āāēáðŨóóáóc ĩŸóũ FTP.
- (ðñĩíáēñāôēēŸ) Āçĩēĩōñābá òuĩ ISO āñ÷ābũĩ āēá ĩŸóá CDROM/DVD media.

Āēá ðāñēóóũðāñāð ðēçñĩōĩñbāð ó÷āðēēŸ ĩā ôçĩ āēáēēáóbá āçĩēĩōñābāð ĩēáð Ÿēāĩóçð, āābôā ôçĩ óāēbāā ôāēĩçñbũóçð release(7).

3.2 ĩāóāāēpôóéóc òuĩ XFree86

Ōĩ āñáóēēũ ðāñēáŨēēĩ **XFree86** ābĩáē Ÿĩá óçĩáĩóēēũ ēñĩŨðē ēŨēā Ÿēāĩóçð āēá ðĩēēĩŸð ÷ ñpôóāð ðĩō ēŸēĩōĩ òĩ FreeBSD āēá óðāēĩŸð āñāóáð. ðñēĩ ôçĩ Ÿēāĩóç 4.6-RELEASE òĩ FreeBSD, ĩē āðbóçĩāð āēüüóāēð òĩō FreeBSD ÷ ñçóēĩĩðĩēĩŸóáĩ ôçĩ Ÿēāĩóç 3.x òuĩ **XFree86**. Ĩ ðēĩ āŸēĩēĩð ðñũðĩð ĩā ĩāóāāēũðôðóáðā áððŸð óēð āēüüóāēð ābĩáē ĩā ÷ ñçóēĩĩðĩēĩŸóáĩ òĩ ðñũāñāĩā `src/release/scripts/X11/build_x.sh`. Áðũũ òĩ ðñũāñāĩā áðāēðāb ĩā ābĩáē pāç óçĩŸĩá óõĩ óŸóçĩŨ óáð òũũĩ òĩ ðāñēáŨēēĩ XFree86 üũĩ ēáē ç āēpóóá Tcl/Tk. ĩāðŨ ôçĩ ĩāóāāēpôóéóc òuĩ ēáðŨēēçēũ X servers, òĩ ðñũāñāĩā ēá ðāēāðŨñāē üēā óā āñ÷ābā óā óðēēĩāŸð āñ÷ābũĩ ðĩō ðāñēĩŸĩāē ĩā āñāē òĩ `sysinstall(8)` ĩŸóá óõĩ ēáðŨēēĩā `XF86336` óõĩ ĩŸóĩ āāēáðŨóóáócð.

ĩāēēĩpĩóáð ĩā ôçĩ Ÿēāĩóç 4.6-RELEASE òĩō FreeBSD, òĩ `sysinstall(8)` āāēáēéóðŨ ôçĩ Ÿēāĩóç 4.x òuĩ XFree86, óáĩ ēāñĩēēŨ ðāēŸóá. ÁððŨ ĩðĩñāb ĩā ābĩáē ābôā óā ðāēŸóá ðĩō āçĩēĩŸñāçóā òĩ cluster òuĩ ports p ĩðĩēāāðĩðā Ũēēā ðāēŸóá ðĩō Ÿ÷ĩōĩ āçĩēĩōñāçēāb āðũ Ÿĩá ports tree ĩā ôçĩ ēáðŨēēçç āðēēŸóá.

Óçĩābũóc: Ābĩáē ðĩēŸ óçĩáĩóēēũ ĩā áðāēñŸóáðā āðũ òĩ āñ÷ābĩ `/etc/make.conf` ĩðĩēáóāpðĩðā òĩðēēŸð ñòēĩbóāēð Ÿ÷āðā ēŨĩāē. Āēá ðāñŨāāēāĩā, āāĩ ābĩáē ēāēp ēāŸā ĩā āēáĩŸĩāðā āēðāēŸóēĩā ðĩō Ÿ÷ĩōĩ ĩāóāāēũðôéóðāb óā ēŨðĩēĩ óðāēāēñēĩŸĩĩ óŸóçĩā ĩā ĩñēóĩŸĩç ôçĩ óēĩp ôçð ĩāóāāēçðpð `CPUTYPE` āēá āāēðēóõĩðĩbçóç òuĩ āēðāēŸóēĩũĩ āēá ēŨðĩēĩ óðāēāēñēĩŸĩĩ āðāĩāñāóðp.

3.3 ðñĩāñŨĩĩáðā Ōñbôũĩ (“ports”)

Ç Óðēēĩāp òuĩ Ports òĩō FreeBSD (<http://www.FreeBSD.org/ports>) ābĩáē ĩēá óðēēĩāp ĩā ðāñēóóũðāñā āðũ 24,000 ðñĩāñŨĩĩáðā āðũ òñbôĩðð, ðĩō ābĩáē āēáēŸóēĩā āēá FreeBSD. ĩē ĩŨāā Āēá÷ābñēóçð òuĩ Ports `<portmgr@FreeBSD.org>` ābĩáē òðāŸððĩēē āēá ôçĩ óõĩðpñçóç āĩũð āŸĩóñĩō āðũ ðçāābĩ ēpāēēá āēá óā ports, ðĩō ĩðĩñāb ĩā ÷ ñçóēĩĩðĩēçēāb āēá ĩā āçĩēĩōñāçēĩŸĩ óā ðāēŸóá ĩā óā ðñĩāñŨĩĩáðā ðĩō óðñāŸĩōĩ óēð āðbóçĩāð āēüüóāēð òĩō FreeBSD.

Ç āēáāēēáóbá óõĩðpñçóçð ôçð óðēēĩāpð òuĩ ports ābĩáē ēŨðē ðĩō āāĩ ĩðĩñĩŸĩā ĩā ēāēŸøĩðĩā āāp. ĩā ĩā÷ũñēóðũ Ũñēñĩ, ĩā ðbðēĩ Ç ĨñāŨtūóc ēāĩóçð òuĩ ðāēŸòuĩ ĒĩāēóĩēēŸ āðũ Ōñbôĩðð (`./releng-packages/article.html`), ēāēŸðāē áðũ òĩ ēŸĩā.

3.4 Āñ÷ābā ISO ôçð ēāĩóçð

ĩāēēĩpĩóáð ĩā ôçĩ Ÿēāĩóç 4.4 òĩō FreeBSD, ç ĩŨāā ÁĩŨðððĩçð òĩō FreeBSD áðĩōŨóēóā ĩā āēáĩŸĩāē ēáē óā ôŸóóāñā ISO āñ÷ābā ðĩō ðñpóā ðĩōēĩŸóáĩ ĩē āðāēñābāð *BSDi/Wind River Systems/FreeBSD Mall* óðēð “āðbóçĩāð” āēāmŸð CDROM ðĩō Ÿēáĩāĩ. ēŨēā Ÿĩá āðũ óā ôŸóóāñā ISO āñ÷ābā ðñŸðāē ĩā ðāñēŸ÷āē Ÿĩá āñ÷ābĩ `README.TXT` ðĩō

ðǎñéǎñÛöǎé óǎ ðǎñéǎ÷ìíǎíǎ òîõ ǎßóêîõ, êé Ýíǎ ǎñ÷ǎßí CDROM.INF ðîõ ðǎñéÝ÷ǎé ìǎðǎ-ðêçñîîññßǎð ǎéǎ íǎ ìðññǎß òî ðñüǎñǎìǎ sysinstall(8) íǎ ǎéÝǎñǎé êǎé íǎ ÷ñçóêîîðîéßóǎé áðòü òî ǎßóêî, êǎêð òé Ýíǎ ǎñ÷ǎßí filename.txt ðîõ ðǎñÝ÷ǎé ìéǎ êßóðǎ ǎñ÷ǎßüí òîõ CDROM. Áðòß ç êßóðǎ ìðññǎß íǎ ǎçìéîññǎçêǎß ðîéý áðêÛ, ùð ǎñßð:

```
/stage/cdrom# find . -type f | sed -e 's/^\.\.\/' | sort > filename.txt
```

Îé óðǎéǎêñéíÝíǎð áðǎéòßóǎéð ǎéǎ êÛêǎ Ýíǎ áðü áðòÛ òǎ CD ðǎñéǎñÛîîíóǎé ðǎñǎéÛòü:

3.4.1 Áßóêîõ 1

Î ðñðòîð ǎßóêîõ ǎßíǎé ó÷ǎǎüí áðîééǎéóóéêÛ áðîðÝéǎóíǎ òçð ǎíóîéßð make release. Îé ìüíǎð ǎééǎǎÝð ðîõ ðñÝðǎé íǎ ǎßñîí óóñí êǎðÛêîñ disc1 ǎßíǎé ç ðññíóèßê ðîõ êǎðÛêîññ tools, òüí XFree86, êǎé üóí òî ǎóíǎóüí ðǎñéóóüðǎññí ðǎéÝòüí ìðññíý íǎ ÷ñÝóíóí óóí ǎßóêî. Î êǎðÛêîññ tools ðǎñéÝ÷ǎé ǎñǎǎéǎßǎ ðîõ áðéòñÝðîí óǎ ÷ñßóðǎð Ûêêüí êǎéðîññǎéêñí óðóðçíÛòüí íǎ òðéÛññîí òéð ǎéóéÝððǎð ǎéêßíçóçð. Áðòüð ì ðñðòîð ǎßóêîõ ðñÝðǎé íǎ òðéÛ÷ǎðǎé bootable Ýðóé ðóðǎ íǎ ìðññíý íé ÷ñßóðǎð òüí ìüðÝññüí ððîéíǎéóóðí íǎ áðîðǎýǎñîí òî óðÛǎéí ǎçìéîññǎð òüí ǎéóéǎððí ǎéêßíçóçð.

Áí ìéǎ ǎéǎóññǎðéêß Ýêǎñóç òüí XFree86 êǎ ǎéǎíÝíǎðǎé ìǎ òçí Ýêǎñóç áðòß, ðñÝðǎé íǎ ǎçìǎññèǎß òî ðñüǎñǎìǎ sysinstall(8) ǎéǎ òçí íÝǎ òÝóç êǎé íé ñǎçǎßǎð ǎǎéǎðÛóðǎóçð. Î ó÷ǎðééüð êñǎééǎð òðÛñ÷ǎé óóñí êǎðÛêîññ src/release/sysinstall óóñí -STABLE êññü ð óóñí êǎðÛêîññ src/usr.sbin/sysinstall óóñí -CURRENT êññü. ÓðǎéǎêñéíÝíǎ, òǎ ǎñ÷ǎßǎ dist.c, menus.c, êǎé config.c êǎ ÷ñǎéǎóðǎß íǎ ǎçìǎññèýíý.

3.4.2 Áßóêîõ 2

Î ǎǎýðǎññð ǎßóêîõ ǎßíǎé áðßóçð áðîðÝéǎóíǎ òçð ǎíóîéßð make release êǎðÛ Ýíǎ ìǎǎÛéí ìÝññð. Áðòüð ì ǎßóêîõ ðǎñéÝ÷ǎé Ýíǎ “live filesystem” ðîõ ìðññǎß íǎ ÷ñçóêîîðîéçêǎß áðü òî sysinstall(8) ǎéǎ íǎ ǎñǎðǎóóíýí ðññǎéßíǎðǎ óǎ ìéǎ ǎǎéǎðÛóðǎóç òîõ FreeBSD. Êé áðòüð ì ǎßóêîõ ðñÝðǎé íǎ ǎßíǎé bootable. Êǎ ðñÝðǎé áðßóçð íǎ ðǎñéÝ÷ǎé Ýíǎ óóíðéǎóíÝñí ǎíóßǎñǎóñ òîõ CVS repository óóñí êǎðÛêîññ CVSROOT êǎé ǎßǎìǎðǎ áðü ǎðññéêÛ ðññǎñÛñǎðǎ óóñí êǎðÛêîññ commerce.

3.4.3 Áßóêîõ 3 êǎé 4

Îé òðüéîéðîé ǎðí ǎßóêîõ ðǎñéÝ÷ǎéí áðéðññüéǎðǎ ðǎéÝóǎ êñǎéóíééý ǎéǎ òî FreeBSD. Óǎ ðǎéÝóǎ êǎ ðñÝðǎé íǎ ǎßíǎé ñǎǎñðîéçíÝíǎ, Ýðóé ðóðǎ êÛêǎ ðǎéÝðîí íǎ ǎßíǎé óóñí ðǎéí ǎßóêî ìǎ üéǎ óǎ ðǎéÝóǎ áðü óǎ ñðíǎ ǎñǎñðÛóǎé ǎéǎ íǎ ǎǎéǎðǎóðǎéǎß êǎé íǎ òñÝíǎé. ðǎñéóóüðǎññð ðêçñîîññßǎð ǎéǎ òçí ǎçìéîññǎß áðòðí òüí ǎßóêüí ǎíǎóÝññíóǎé óóñí Ûñèññ Ç ÎñǎÛîùόç êǎñóçð òüí ðǎéÝòüí Êñǎéóíééý áðü Òñßðîðð (../releng-packages/article.html).

4 Áéǎññß òüí Áêäüüóàùí

4.1 ÁñðççñǎðçðÝð FTP

¼ðǎí ç Ýêǎñóç ǎßíǎé Ýóîéíç, Ý÷ǎé ǎñééíǎóðǎß ǎéðǎñðð, êǎé Ý÷ǎé ðǎéǎðǎñéóóǎß ǎéǎ ǎéǎññß, ì êýñéîð FTP ǎñðççñǎðçðð ðñÝðǎé íǎ ǎçìǎññèǎß. Îé áðßóçññé ǎñðççñǎðçðÝð FTP òîõ FreeBSD ǎßíǎé üéîé mirrors ǎñüð êýñéîð ǎñðççñǎðçðð óóñí ñðíßí Ý÷ǎéí ðññóǎǎóç ìüñ Ûêéîé FTP ǎñðççñǎðçðÝð. Áðòüð ì ǎñðççñǎðçðð ǎßíǎé ǎñüðüð ùð ftp-master. ¼ðǎí ç Ýêǎñóç ǎßíǎé Ýóîéíç, ðñÝðǎé íǎ ǎçìǎññèýíý òǎ ðǎñǎéÛòü ǎñ÷ǎßǎ óóñí ftp-master:

[/pub/FreeBSD/index.html](#)

λέα ἀδῆP web οἰαῖβᾶᾶ ὄϊο ὀᾶῖῖÉY ÷ ᾶῖ ᾶᾶῖῖῖῖῖ ὀᾶ ᾶῖUῖῖῖῖῖῖ ὀῖῖᾶῖῖῖῖῖῖ FTP ῖᾶῖῖῖῖῖῖῖ ᾶῖᾶ ὀῖῖ ὀῖῖY ÷ ῖῖῖᾶ Yῖᾶῖῖῖ ὀῖῖ FreeBSD.

```
/pub/FreeBSD/releases/arch/x.y-RELEASE/
```

I éadóUeraíð aðú óní rðirí ðríñrý íá áßñóí áæéáoósóÜóáéo ìÝóù FTP, üðüò óñí Ý÷æ ðñíáoíeíÜóáé ç áfóieP make release.

```
/pub/FreeBSD/ports/arch/packages/packages-X.Y-release/
```

¼ëá ôá ðñĩĩãôããëùôôéóìÝíá ðáéÝôá ãéá ôçì ôñÝ÷ĩõóá Ýëäĩõç.

```
/pub/FreeBSD/releases/arch/X.Y-RELEASE/tools
```

Îéá óõïâîëëêÐ óõïôùîâõóç ãéá ôîí êáôÛëîäí .../.../.../tools.

/pub/FreeBSD/releases/arch/X.Y-RELEASE/packages

```

λέά όοίâîëëêP όοίôùîâóóç äéá ôîí êáoÜëîāī .../.../ports/i386/packages-X.Y-release.

```

```
/pub/FreeBSD/releases/arch/ISO-IMAGES/x.y/x.y-*.iso
```

Ôá áñ÷åßá ISO.

Ἄεά ḁāñēōōūōāñāō ḁēçñīōīñḁāō ó÷āōēēŪ īā ôçī īñāŪñūōç ôūī mirror āēāñḁō FTP ôīō FreeBSD, ḁāñāēāēḁ āāḁōā ôī Ūñēñī ŌōēŪ÷ñīōāō Ḃīā FreeBSD mirror (../hubs/).

[illegible]

4.2 Àíáðáñáũùã òúi CD-ROM

[illegible]

5 Åăăêôáóéìüôçôá

[illegible]

5.1 Āçĭēĭōñāβā ĐñĭóáñĭōĭŸĭñĭ Āéóēāōōpĭ Āēēβĭçóçð.

ĐĭēēŸð āēēāóáóōŨóāēð Ÿ÷ĭōĭ đĕŷđēĭēāð áđāēðPóāēð đĭō ĭđĭñāβ ĭā òç óāēñŨ òĭōð ĭā áđāēōĭŸĭ òçĭ đñĭōēPēç đāñēóóóūðāñĭ ĭāçāpĭ P āñāāēāβñĭ ÷ñPóçç òóēð āēóēŸððāð āāēāðŨóóáçðð. Ĩ “ĭđāēŨēēēĭō” òññđĭð ĭā òĭ ēŨĭāðā áððñ āβĭāē ĭā ēŨĭāðā òēð āēēāŸð óāð óōñĭ ēāðŨēĭāĭ đĭō Ÿ÷āē āōĭēĭŨóāē ĭāðŨ òĭ òŸēĭð òçð ç āēāāēēāóβā make release:

- ĐāñŨóðā òā patches óāð P đñĭōēŸððā òā āðēðēŸĭñ āñ÷āβā ĭŸóā óōñĭ ēāðŨēĭāĭ chroot òçð Ÿēāĭóçð.
- `rm ${CHROOTDIR}/usr/obj/usr/src/release/release.[59]`
- ĭāðāāēñððóðā đŨēē òĭ sysinstall(8), òĭ đðñPĭā, P ũđĭēā Ũēēā đñĭāñŨñāðā Ÿ÷ĭōĭ āðçñāāóóāβ āðñ òēð āēēāŸð óāð.
- `chroot ${CHROOTDIR} ./mk floppies`

ĭē ĭŸāð āēóēŸððāð āāēāðŨóóáçðð ēā āçĭēĭōñāçēĭŸĭ óōñĭ ēāðŨēĭāĭ \${CHROOTDIR}/R/stage/floppies.

ĀĭāēēāēðēēŨ, ĭđĭñāβðā ĭā ÷ñçóēĭđĭēPóāðā òĭ make target boot.flp, P ĭđĭñāβðā ĭā òñŸĭāðā áðāðēāβāð òĭ script đĭō āçĭēĭōñāāβ òā óðððPĭāðā āñ÷āβñĭ src/release/scripts/doFS.sh.

ĭđĭñāβðā āðβóçð ĭā ēāñĭβóðāð þóðā āēēŸð óāð āēēāŸð ĭā đāñāóōĭŸĭ ĭā ĭññðP patch óçĭ Ÿēāĭóç ũðñð ēā òēēŨ÷ĭāðāē, āβñĭðāð òēĭP óçĭ ĭāðāāēçðP LOCAL_PATCH ũðāĭ òñŸĭāðā òçĭ āĭðĭēP make release.

5.2 Đñĭāñāĭāðβāĭĭóāð òĭ sysinstall

Ōĭ āñāāēāβĭ āāēāðŨóóáçðð ēāē ñŷēĭóçð òĭō FreeBSD, òĭ sysinstall(8), ĭđĭñāβ ĭā đñĭāñāĭāðēóðāβ āēā ĭā ēŨĭāē ðēĭ āŷēĭēāð òēð áððñāðĭđĭēçĭŸĭāð āāēāðáóðŨóāēð òā đĭēēŨ ĭç÷āĭPĭāðā. Áððñ òĭ ÷āñāēðçñēóðēēñ òĭō đñĭāñŨñāðĭð ĭđĭñāβ ĭā ÷ñçóēĭđĭēçēāβ òā óōĭāðóāñĭ ĭā òĭ PXE[13] òçð Intel āēā ĭā ĭāēēĭPóāē ç āāēāðŨóóáçðð āðñ òĭ āβēððĭ, P òā óōĭāðóāñĭ ĭā đñĭóáñĭōĭŸĭāð āēóēŸððāð āēēβĭçóçð ēē Ÿĭā sysinstall script. ĭā đāñŨāāēāĭā āðñ òŸðĭēĭ sysinstall script ĭđĭñāβðā ĭā āñāβðā òðĭ āñ÷āβĭ src/release/sysinstall/install.cfg.

6 ĭāēPĭāðā òĭō ĐPñāĭā āðñ òçĭ ēēāĭóç 4.4 òĭō FreeBSD

Ç āēāāēēāóβā āðĭēĭāðāð òçð Ÿēāĭóçð 4.4 òĭō FreeBSD ĭāēβĭçóā āðβóçĭā òçĭ ĭç Áðāĭŷóðĭð 2001. ĭāðŨ āðñ áððP òçĭ çĭāññĭçĭā, ũēāð ĭē āēēāŸð òðñĭ ēĭñĭñū RELENG_4 òĭō FreeBSD Ÿðñāðā ĭā Ÿ÷ĭōĭ Ÿāēñēóç āðñ òçĭ ĨŨāā ĨñāŨñóçð òñĭ Āēäüóäñĭ <re@FreeBSD.org>. Ç đñPðç āĭēēĭāóðēēP Ÿēāĭóç āēā òçĭ āñ÷ēðāēðĭēēP x86 Ÿāēĭā āēāēŸóēĭç òóēð 16 Áðāĭŷóðĭð, ēē āēĭēĭōēPēçēā āðñ 4 āēñĭā āĭēēĭāóðēēŸð āēäññóāēð đĭō ĭāPāçóāĭ óçĭ òāēēēP Ÿēāĭóç òóēð 18 òĭō ÓāððŸĭāñç. Ĩ òðāŷēðñð áóðŨēāēāð Ÿðāēĭā óçĭāĭðēēñ ññēĭ ēāðŨ òçĭ āēŨñēāēā òçð òāēāððāβāð āāāñŨāāð ēāēþð ēŨðĭēā đñĭāēPĭāðā áóðŨēāēāð āñŸēçēāĭ òā đñĭçāĭŷĭāĭāð, āĭēēĭāóðēēŸð āēäññóāēð. ÓðñĭēēŨ, đŨĭñ āðñ 500 email óðŨēçēāĭ óçĭ ĨŨāā ĨñāŨñóçð òñĭ Āēäüóäñĭ <re@FreeBSD.org> òā āēŨóçĭā ĭēēññðāñĭ āðñ Ÿĭā ĭPĭā.

Ç ēĭēĭñðçðā òñĭ ÷ñçóðPĭ ĭāð Ÿēāĭā óāðŸð ũðē ç áóðŨēāēā ēāē ç óðāēāñññðçðā ĭēāð Ÿēāĭóçð āāĭ ēŨ 'ðñāðā ĭā ēððēŨēāðāē āēā ēāĭāññð āβāñð ðñĭēāóĭβāð P çĭāññĭçĭāð đĭō Ÿ÷ĭōĭ òāēāβ óāĭ òðñ÷ĭē āðñ đñēĭ. Ōĭ FreeBSD Ÿ÷āē ĭāāāēþóāē āñāĭāðēēŨ ēāðŨ òç āēŨñēāēā òçð æñPð òĭō óāĭ óŷóçĭā, ēāē ç āĭŨāēç āēā óðāēāēñēĭŸĭç đĭēēðēēP ēāē ĭñāŨñóçð āēā òçĭ āçĭēĭōñāβā ĭŸñĭ āēäññóäñĭ āβĭāē ðēŸĭñ óāĭāñP đāñēóóóūðāñĭ āðñ đĭōŸ. ÁððP ç āĭŨāēç ēā āβĭāē āēñĭā ðēĭ óçĭāĭðēēP ēāēþð òĭ FreeBSD ēā āñ÷āβāē ĭā ĭāðāŷŸñāðāē òā ĭŸāð ðēāððññāð.

7 ÎáëííîééÝò Éáôãðëýíóáéò

Ãβíáé æüðééðò óçíáóβáð íé ðñáéðééÝò éáé ç îñÃÛîóç òçð ãéááééáóβáð äçíéíðñáð òùí áêäüóäùí íáð íá óðíáááβæííí íá òçí óðíá÷ð ðóíáíüíáíç áÛóç òùí ÷ñçóðíí íáð. Îá áÛóç áððð òç óéÝðç áñááæüíáóðá ðéçñÛ áéá íá ðáèíçñéðóíðíá òçí áéááééáóβá ðáñááüãðò òùí áêäüóäùí òîõ FreeBSD.

- *ÐáñÛëççç áêðÝéáóç* - ÎáñééÛ ìÝñç òçð ìáðáãéðððéóçð íéáð ááéáðÛóðáóçð ìðñíýí íá áβíííí “ðñéý ðáñÛëçççá”. Óá ðéí ðñééÛ áðü ðá óðÛáéá áβíáé I/O intensive, ìðüðá ç ýðáñíç ðñééðí ððçððð-ðá÷-ýðçðáð áβóéüí áβíáé ðéí óçíáíðééð áðü òçíí ÷ñðç ðñééðí áðáíáñááóðíí áéá íá áðéðá÷ðñéáβ éÛðüð ç áéááééáóβá ðîõ make release. Áí áéáóñíáðéééβ áβóéíé ÷ñçóéíðñéççýíí áéá ðíðíáðá òçð éáñáñ÷ð ðîõ chroot(2) ðáñéáÛëçíðò, ðüðá ðí CVS checkout òùí éáðáéüüí ports éáé doc ìðñíáβ íá áβíáé ðáððü÷ñííá íá òçí áñóñéð make world ððñí Ûëéí áβóéí. ×ñçóéíðñéççýíí íéá RAID éýóç (hardware ð software) ìðñíáβ íá ìáéðóáé áñáóðééÛ ðñí óðñéééü ÷ñññ ðîõ ÷ñáéÛæáðáé íá ìáðáæüðððéóðáβ íéá ðéðñçð Ýéáñóç.
- *Îáðáãéðððéóç áêäüóäùí áéá áéáóñíáðéééÝò áñ÷éðáðñééÝò* - ÈÝéáðá íá ìáðáæüðððóáðá íéá Ýéáñóç áéá IA-64 ð Alpha óá éÛðñéíí x86 áðáíáñááóðð? make TARGET=ia64 release.
- *ÁñééíÝð áéá éÛç* - ×ñáéáæüíáóðá éáéýðáñá áñááéáβá áéá áððüíáðí Ýéáñ÷ñ ìñéüðçðáð ððñí FreeBSD.
- *Áñááéáβá ÁáéáðÛóðáóçð* - Õñ ðñüáñáñÛ íáð áéá òçí ááéáðÛóðáóç ðîõ FreeBSD Ý÷áé ìáðáñÛóáé ðññ ðñééý ðñí áíáíáñüññ ÷ñññ æüðò ðîõ. ÕðÛñ÷ñíí áéáóñíáð ìñÛáð ðîõ áñáÛéííóáé áéá íá ðéíðñéðóíðíí éÛðñéíí Ûëéí, ðéí ìñóÝñññ ìç÷áíéðüí ááéáðÛóðáóçð. Îéá áðü ðéð ðéí ððñó÷ñíáð, áβíáé ç ìñáá libh[5] ðîõ óðñ÷áýáé òçí ðéíðñéççççç áñüð Ýñðññ, ìÝñ ðññðñð ðáéáðáñβóíáðñ éñáéóíéçý éáé áñüð GUI ðññáñÛñáðñ ááéáðÛóðáóçð.

8 Áð÷áñéóðβáð

Éá ðéáéá íá áð÷áñéóððü ðññ Jordan Hubbard, ðîõ ìñó Ýäüóá òçí áðéáéñβá íá ðÛññ éÛðñéá áðü òçí áðéýíç òçð Ýéáñóçð 4.4 ðîõ FreeBSD, éáðð éáé áéá üçç òçí áñóéáéÛ ðîõ Ý÷áé éÛñáé áð éáé ÷ñññéá áéá íá áβíáé ðñ FreeBSD áððü ðîõ áβíáé óðñáñá. ÕðéééÛ, ç Ýéáñóç ááñ éá ðóáí ðñóÝ áðñáðññ íá ìñéççññéáβ ÷ññð üçç òçí ó÷áðééð ìá òçí Ýéáñóç áñóéáéÛ ðîõ Ýéáíáí íé Satoshi Asami <asami@FreeBSD.org>, Steve Price <steve@FreeBSD.org>, Bruce A. Mah <bmah@FreeBSD.org>, Nik Clayton <nik@FreeBSD.org>, David O’Brien <obrien@FreeBSD.org>, Kris Kennaway <kris@FreeBSD.org>, John Baldwin <jhb@FreeBSD.org> éáé üéíé íé ððñéíéðñé ðñó áð÷ñéýíóáé ìá òçí áñÛððñíç ðñó FreeBSD. ÈÝéü áðβóçð íá áð÷áñéóððü ðñðò Rodney Grimes <rgrimes@FreeBSD.org>, Poul-Henning Kamp <phk@FreeBSD.org>, éáé üéñð ðñðò Ûëéñð ðñó áñáÛóççáí áéá íá ððéÛññí ðá áñááéáβá áéá ðéð áêäüóáéð óðéð ðñðáð ìÝñáð òçð äçíéíðñáð ðñó FreeBSD. Áððü ðñ Ûñéññ Ý÷áé áðçñááóðáβ áðü éáβíáíá ó÷áðééÛ ìá òçí îñÃÛîóç òùí áêäüóäùí áðü ðñ CSRG[14], òçí ìñáá ðñó NetBSD[11], éáé òçí ðññóáóç áéá íéá áéááééáóβá îñÃÛîóçð òùí áêäüóäùí ðñó John Baldwin[12].

9 ÁíáðññÝò

[1] CVS - Concurrent Versions System <http://www.cvshome.org>

[2] CVSup - The CVS-Optimized General Purpose Network File Distribution System
<http://www.polstra.com/projects/freeware/CVSup>

[3] <http://bento.FreeBSD.org>

[4] FreeBSD Ports Collection <http://www.FreeBSD.org/ports>

[5] The libh Project <http://www.FreeBSD.org/projects/libh.html>

- [6] FreeBSD Committers
http://www.FreeBSD.org/doc/en_US.ISO8859-1/articles/contributors/staff-committers.html
- [7] FreeBSD Core-Team http://www.FreeBSD.org/doc/en_US.ISO8859-1/articles/contributors/staff-core.html
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- [11] NetBSD Developer Documentation: Release Engineering <http://www.NetBSD.org/developers/releng/index.html>
- [12] John Baldwin's FreeBSD Release Engineering Proposal <http://people.FreeBSD.org/~jhb/docs/releng.txt>
- [13] PXE Jumpstart Guide http://www.FreeBSD.org/doc/en_US.ISO8859-1/articles/pxe/index.html
- [14] Marshall Kirk McKusick, Michael J. Karels, and Keith Bostic: *The Release Engineering of 4.3BSD*
(<http://docs.FreeBSD.org/44doc/papers/releng.html>)